

REMARKS AND AMENDMENTS

U.S.C. 112 Rejection and Amendment

The Examiner has rejected claims 1-8 and 11 because an amendment proposed in the previous office action does not appear to be supported by the specification. In particular the language rejected states

“wherein the polymer is free of non-monomeric amines with primary functionality, secondary functionality, or mixtures thereof”.

In view of the rejection made by the Examiner this language has been deleted from the presently amended specification. The Applicant submits that the deletion of this rejected text obviates the U.S.C. 112 rejection to claims 1-8 and 11.

In view of the deletion of the language above the U.S.C. 112 rejection to claim 8 is obviated because claim 1 now allows for the presence of amines.

No other amendments are contemplated at this time.

U.S.C. 103 Rejection

The Examiner maintained the 35 U.S.C. 103 rejection over Tipton (US 5,354,485) in view of Lange (US 6,258,761).

The Examiner contends that Tipton discloses a grease composition comprising an esterified polymer, a thickening agent and an oil of lubricating viscosity. Further the Examiner contends that the esterified polymer of Tipton disclosed in column 21, lines 19-28 overlaps the presently claimed polymer. The Examiner further contends that Tipton discloses utilising 1 wt % of the esterified polymer as is described in column 23, lines 23 to 26. The Examiner indicates that Tipton does not disclose the total acid number of the polymer.

The Examiner used Lange for its disclosure of a lubricating composition comprising an esterified maleic-anhydride styrene copolymer with a TAN of 15 and 12.2, see column 1, lines 4-7, column 8, lines 56-53; Example A-1 in column 15. The Examiner contends that as the TAN values of Lange overlap the present invention, the resultant grease from combining Tipton with Lange would intrinsically comprise these properties. The Applicant respectfully traverses the combination of Tipton and Lange would derive the presently claimed invention.

Tipton discloses a lubricating composition comprising an oil of lubricating viscosity and an organic ammonium thiosulfate. The organic ammonium thiosulfate is described as providing antiwear, extreme pressure and/ friction properties. The use of the organic ammonium thiosulfate is described in separate embodiments as being used in lubricants and greases. As the Examiner is aware, whilst greases and lubricants are known in the same general technical field the properties of such materials are very different. As the enclosed pages of Kirk-Othmer demonstrate a lubricating oil from petroleum is a complex mixture of hydrocarbon molecules. These generally range for low viscosity oils to more viscous lubricants (see page 484). In contrast a grease is a lubricating oil that is thickened with a gelling agent (see page 501). Gelling agents are described on page 502. Accordingly, from Tipton, the only reference made by the Examiner to the esterified polymer as described in column 21 of Tipton is explicitly disclosed in the lubricant described in Example IX (see column 23). This example is an embodiment wherein the esterified polymer is a lubricant and not a grease. This embodiment is specifically described in column 22, line 26 and 27 as “The following examples relate to lubricating compositions containing organic ammonium thiosulfates.” This clearly demonstrates that Example IX is purposely disclosing a lubricant containing organic ammonium thiosulfate and the esterified maleic-anhydride-styrene copolymer described in column 23, lines 23 to 25. Example IX therefore relates only to a lubricant; and does not relate to a grease, which as noted above are different compositions.

However, the Applicant respectfully submits that the reference to Example IX merely relates to the embodiment whereby the organic ammonium thiosulfate and the esterified maleic-anhydride styrene copolymer are used in a lubricant. Reference to a grease in column 23, line 55 to column 24, line 34 is a separate embodiment. As such person skilled in the art would take the disclosure of the lubricant and grease separately. Furthermore in the disclosure of grease in column 23, to column 24, there is no disclosure or teaching to use the esterified maleic anhydride styrene copolymer as is referred to by the Examiner based on lubricant Example 9. Even within the disclosure of the grease examples G-1 and G-2 no reference is made to the esterified polymer. The examples describe employing only the organic ammonium thiosulfates prepared in Example 1 (see column 7, lines 18 to 41) and Example 5 (see column 8, lines 34 to 54)

respectively. Accordingly, the Applicant submits that there is no reason for a person skilled in the art of greases to derive a grease composition containing anything more than the lithium grease having 4 % by weight of organic ammonium thiosulfate. In other words, Tipton does not disclose, teach or otherwise suggest greases containing esterified maleic anhydride styrene copolymers.

Even if a person skilled in the art were to assume that Tipton did disclose such a combination, the combination with Lange would still not derive the presently claimed invention.

Lange discloses a composition comprising reacting (i) an esterified carboxy-containing interpolymers, and (ii) a hydrocarbyl substituted carboxylic acid or functional derivative thereof. This is clearly stated in the abstract, and summary of the invention of Lange. In particular see column 5, line 65 to column 6, line 25. The disclosure in column 8, line 56 to column 17, line 33 describe the interpolymers to be reacted with the hydrocarbyl substituted carboxylic acid. The highlighted text expressly includes the reference made by the Examiner to the polymer of Example A-1 having a TAN of 14.6.

From the Example shown in column 30, line 48 to column 34, line 27, it is noted that Examples A-1 to A-9 are then reacted with variety of hydrocarbyl substituted carboxylic acids as described in Examples P-1 to P-10 (see column 28, line 15 to column 29, line 33 for a detailed description of each hydrocarbyl substituted carboxylic acid reactant). The resultant product from reacting (i) an esterified carboxy-containing interpolymers, and (ii) a hydrocarbyl substituted carboxylic acid or functional derivative thereof are described after each example. For instance see the table at the bottom of column 30, or the table in column 31, lines 10 to 25. The resultant product is described in the tables of column 30 and 31 as having a TAN of 1.53, 1.49, 1.05, 0.96, 1.03, 1.78, 3.5, 1.67, 2.7 and so on. Accordingly, Lange discloses a reaction product that has a TAN of less than four. In addition, the reaction product of Lange is chemically very different from the presently claimed polymer. The reason being Lange reacts the esterified polymer intermediate described therein with the hydrocarbyl substituted carboxylic acid. Lange does not disclose, teach or otherwise suggest employing the examples referred to by the Examiner directly in a lubricant. This is in contrast to the present invention that utilises the presently claimed esterified polymer is the grease.

If a person skilled in the art were to combine the disclosure of Tipton and Lange it is submitted that the resultant invention would be a lubricant containing an organic ammonium thiosulfate and a reaction product of (i) an esterified carboxy-containing interpolymer, and (ii) a hydrocarbyl substituted carboxylic acid or functional derivative thereof. This combination is not the same as the presently claimed invention. Nor does the combination of Tipton and Lange teach the presently claimed invention. The presently claimed invention is a grease composition containing the presently claimed esterified polymer. Accordingly, a person skilled in the art would have not expectation that utilising the presently claimed esterified polymer would provide a grease with the water wash-off properties as is described in the application as filed and as is also stated in amended independent claim 1.

In view of the remarks and reasoned statements highlighted above, the Applicant believes that the present invention meets the requirements of 35 U.S.C. 103 i.e., the present invention is unobvious over Tipton in view of Lange. In the event that the Examiner believes that the amendments submitted along with this response do not result in allowance, the Examiner may telephone me at the telephone number listed below. The telephone call would be focus on resolving any outstanding rejections.

The Commissioner is authorized to charge any required fees or credit any overpayment of fees to The Lubrizol Corporation Deposit Account No. 12-2275.

Respectfully submitted,

THE LUBRIZOL CORPORATION

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